

Clarissa Colmer

09/22/2006

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1 group in the engine division only.

2 Q. Okay. And you replaced Mr. Warner?

3 A. Correct.

4 Q. When did Caterpillar decide to stop reimbursing

5 for flywheel house and flywheel house bolt

6 repairs on Trans-Spec trucks?

7 A. From my discussions with the people I named

8 earlier, I'm of the understanding that it was

9 mid 2003.

10 Q. What is Caterpillar Extended Service Coverage

11 Plus?

12 A. Extended Service Coverage Plus is a coverage

13 program that is a purchased program that covers

14 specific components for defects in Caterpillar

15 material and workmanship for a specific amount

16 of time as noted on the contract.

17 Q. What entity offered Trans-Spec the extended

18 service coverage?

19 A. Who offered them this extended service

20 coverage?

21 Q. Yes.

22 A. I'm not sure if it was the Caterpillar -- I

23 don't -- I don't know exactly who offered it to

Page 15

1 them specifically.

2 Q. Does Caterpillar offer this program or is it

3 something that's offered by local Caterpillar

4 dealers, such as --

5 A. Caterpillar has the program available.

6 Q. -- Southworth Milton?

7 MR. GRUNERT: I should probably object to

8 the form because I think the witness is

9 struggling with your use of the word "offered".

10 In the sense of who's the contracting

11 entity or --

12 MR. SAMITO: I'm going to get to that.

13 BY MR. SAMITO:

14 Q. I want to know first off who offered the

15 extended service coverage to Trans-Spec.

16 MR. GRUNERT: I object to the form.

17 A. I guess if you would clarify "offered"?

18 Q. Who contacted Trans-Spec and said would you

19 like to participate in this program?

20 A. I do not know who specifically made that.

21 Q. Is it a Caterpillar program?

22 A. It's a Caterpillar program.

23 Q. Why does Caterpillar offer customers the

Page 16

1 extended service coverage plan?

2 MR. GRUNERT: Object to the form and also

3 beyond the scope of the notice.

4 You can answer it if you're able to do

5 that on your personal knowledge.

6 But that's not within the scope of

7 anything she was asked to testify about.

8 MR. SAMITO: Well --

9 MR. GRUNERT: She hasn't prepared herself.

10 MR. SAMITO: -- what we're getting into is

11 compliance at issue here.

12 MR. GRUNERT: You can answer if you can

13 answer based on personal knowledge. It's

14 beyond the scope of the notice.

15 A. Repeat the question, please.

16 Q. Why does Caterpillar offer customers the

17 extended service coverage plan?

18 A. Because the marketplace asked for a coverage

19 plan in addition to what's available under

20 standard warranty, but it is not -- it's an

21 option, it's not something that everybody

22 participates in.

23 Q. Is it offered to all Caterpillar customers?

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1 A. It is available for purchase by any Caterpillar

2 user owner.

3 Q. So anybody could purchase it?

4 A. If they own a Caterpillar engine. And -- and

5 there's a coverage program available for

6 purchase.

7 Q. Does Caterpillar have to make any determination

8 as to which customers to offer the extended

9 service coverage plan to?

10 A. It's -- it's a publicly available program,

11 anyone is available to purchase and

12 participate.

13 Q. Are you aware of any conferences that were held

14 between Harry Calderbach(ph) and Chad Bixby in

15 terms of determining whether to offer the

16 extended service coverage plan?

17 A. No, I am not.

18 Q. Did Caterpillar offer it on several 3176

19 engines purchased by Trans-Spec in the mid

20 1990's?

21 A. I am not aware of that information.

22 Q. Do you know if Caterpillar offered it and

23 Trans-Spec accepted as to any of Trans-Spec's

EXHIBIT

Exhibit D

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1 warranty at the same time.

2 (Whereupon a discussion was held
3 off the record.)

4 BY MR. SAMITO:

5 Q. When did you first learn of claims coming in
6 regarding flywheel housing or flywheel housing
7 bolt failures on the c-12?

8 MR. GRUNERT: Object; beyond the scope of
9 the notice.

10 Answer if you can from personal knowledge.

11 A. I'm not specifically aware of the date. I'm
12 not aware of a specific date.

13 Q. Did you ever learn that there were claims
14 coming in on flywheel housing and flywheel
15 housing bolts on the C-12?

16 A. No.

17 Q. You never heard that?

18 A. Not until this came up.

19 Q. When did you first learn about Trans-Spec's
20 problems?

21 A. In this situation. The date, I'm sorry, I
22 don't remember the date. Recently.

23 Q. Within the last six months?

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1 A. Correct.

2 Q. Did Caterpillar stop reimbursing under warranty
3 for extended service coverage for flywheel
4 housing and flywheel housing bolt repairs on
5 C-12s owned by a company other than Trans-Spec?

6 A. I'm not aware of our specific actions.

7 MR. GRUNERT: I object, it's beyond the
8 scope.

9 Q. Well, what I'm trying to get at is, is
10 Trans-Spec the only company that you stopped
11 reimbursing flywheel housing and flywheel
12 housing bolts for?

13 A. I have not looked at the data regarding
14 flywheel housing repairs and claims to see what
15 was paid or not paid.

16 Q. As head of the warranty claim department for
17 on-truck engines, do you know?

18 A. That is not something that I get into the
19 detail on.

20 Q. Never heard anything about C-12 flywheel
21 housing and flywheel housing bolts warranty
22 claims and that Caterpillar decided to stop
23 reimbursing?

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1 A. No, I did not.

2 Q. You didn't do any research into that area to
3 prepare for this 30(b)(6) deposition, did you?

4 MR. GRUNERT: No, because it was beyond
5 the scope of the notice.

6 BY MR. SAMITO:

7 Q. Do you know why Caterpillar decided to stop
8 reimbursing for flywheel housing and flywheel
9 housing bolts failures on Trans-Spec's C-12s?

10 A. In my discussion with Rob Smith and Brad
11 Bowdoin, I understand that they made the
12 decision that these repairs should no longer be
13 covered.

14 Q. Why?

15 A. Because they felt it was not a failure in CAT
16 material or workmanship, it was not a defect of
17 the Caterpillar material or workmanship.

18 Q. Who did they consult with when they came to
19 that decision?

20 A. I understand that that information was
21 communicated back to the CAT dealer.

22 Q. I'm asking who did they communicate with when
23 they made the decision? Did they speak with

Page 53

1 any Caterpillar engineers? Did they speak with
2 a 6 Sigma team? Did they make this decision on
3 their own?

4 A. I understood product health was involved, Brad
5 Bowdoin. I do not know specifically who else
6 he worked with in making that determination.

7 Q. What were the communications that they had with
8 Brad Bowdoin?

9 A. I understand that they reviewed the detail with
10 Brad, shared technical information with him,
11 shared the service history with him.

12 Q. Who is Brad Bowdoin?

13 A. At that time he was a product health -- product
14 health engineer. I'm not specific on his job
15 title.

16 Q. Was he an engineer?

17 A. I do not know if engineer was in his title.

18 Q. Do you know if he even has an engineering
19 degree?

20 A. I do not know if he has an engineering degree.

21 Q. Has he ever served as an engineer?

22 A. I'm not exactly clear if he's an engineer or if
23 he did engineering functions. He was in

14 (Pages 50 to 53)

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1 product health.

2 Q. Are either of the two gentlemen who made the

3 decision to stop reimbursing for Trans-Spec's

4 problems, are either of them engineers?

5 A. I do not know.

6 Q. Is there any documents that were looked at when

7 Caterpillar made this decision to stop

8 reimbursing for Trans-Spec's --

9 A. I am not aware of what documentation was

10 provided between the district office and

11 product health.

12 Q. Did you ask in preparation for this Rule

13 30(b)(6) deposition?

14 A. I'm not -- I don't recall exactly if they

15 looked at iron, I do know they looked at repair

16 history.

17 Q. Was the decision to stop reimbursement for

18 Trans-Spec's flywheel housing and flywheel bolt

19 failures on C-12 engine a specific decision as

20 to Trans-Spec or was it part of a larger

21 Caterpillar policy on this issue?

22 A. I understand from visiting with Brad Bowdoin

23 and Rob Smith that the conditions surrounding

Page 55

1 the units of Trans-Spec were such that they

2 determined that it was not a CAT defect in

3 material and workmanship.

4 Q. How did they come to that determination?

5 A. Through the discussion of the application the

6 unit was in. I don't know all the details that

7 were shared between them.

8 Q. Did you --

9 A. But they also looked at the history of the C-12

10 in general and that particular failure and

11 determined that this was not a problem.

12 Q. Was any engineer involved in making that

13 determination?

14 A. I cannot say. I do not know.

15 Q. Was any engineer report involved in making that

16 determination?

17 A. I do not know.

18 Q. Was any 6 Sigma team involved in making that

19 determination?

20 A. I understand there was a 6 Sigma team. I do

21 not recall when it was chartered or when it was

22 completed.

23 Q. Do you know if anyone contacted anybody in that

Page 56

1 6 Sigma team for guidance on this issue?

2 A. Who are you referring to as anyone?

3 Q. Anyone from the warranty claims department.

4 A. I'm not aware of anyone within the warranty

5 department who contacted the 6 Sigma team.

6 What -- what date are you --

7 Q. At any time regarding Trans-Spec's flywheel

8 housing or flywheel housing bolt failures.

9 A. I'm not aware of any direct conversation

10 regarding Trans-Spec and flywheel housing

11 failures and the 6 Sigma team.

12 Q. Can you give me the positions of the two

13 gentlemen who decided to stop reimbursing for

14 Trans-Spec's flywheel housing and flywheel

15 housing bolt failures?

16 A. Brad Bowdoin, he was in product health. I'm

17 not sure what his specific title was at the

18 time.

19 Q. And who was the other person?

20 A. I believe he was the primary person that was

21 involved. I do not know who else he'd involved

22 in making that decision other than the field

23 rep was Rob Smith.

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1 Q. Where was Rob Smith located?

2 A. I'm not exactly sure which city he lived in at

3 the time. He was the rep in the northeast at

4 that time.

5 Q. Was he in the Connecticut office?

6 A. I do not know which office he was located in.

7 Q. Who is Michael Powers?

8 A. At that time he was the regional manager of the

9 northeast district.

10 Q. Was he involved in this decision as well?

11 A. I understand he was involved.

12 Q. How was he involved?

13 A. I understood he -- he spoke with Louis Vachon

14 regarding the details of the matter. And

15 confirmed with Louis that it was not a

16 Caterpillar problem.

17 Q. Who is Louis Vachon?

18 A. At that time he was the supervisor of the truck

19 engine call center.

20 Q. Was Mr. Vachon an engineer?

21 A. I do not know.

22 Q. Did Mr. Vachon speak with any 6 Sigma team in

23 coming up with this decision?

15 (Pages 54 to 57)

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1 A. I do not know who Louis may or may not have
 2 spoken to.
 3 Q. Who else may have been contacted as part of the
 4 decision making process to stop reimbursing for
 5 Trans-Spec flywheel housing failures and
 6 flywheel housing bolt failures?
 7 A. I'm not sure who else was contacted.
 8 Q. Were there any documents on this issue?
 9 A. I am not aware of any document specific to
 10 Trans-Spec.
 11 Q. Any e-mails on this issue?
 12 A. I'm not aware of any e-mails specific to
 13 Trans-Spec.
 14 Q. Who was the specific person who made the
 15 decision to stop reimbursing Trans-Spec for
 16 flywheel housing and flywheel housing bolt
 17 failures?
 18 MR. GRUNERT: I'll object to the form.
 19 A. I'm not exactly sure if there was one person
 20 specifically involved. I know Brad Bowdoin had
 21 significant input into the decision.
 22 Q. But there's not one person that you can point
 23 to as having the authority to make this

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1 decision?
 2 MR. GRUNERT: Object to the form.
 3 A. I cannot say that one person made this
 4 decision.
 5 Q. So if I asked you who made the decision --
 6 A. I know Brad Bowdoin was significantly involved
 7 in making the decision.
 8 Q. Did they make any determination that it was a
 9 Sterling problem.
 10 A. I do not know if they determined what the root
 11 cause of the problem was.
 12 Q. Why did Caterpillar decide to stop providing
 13 reimbursement?
 14 A. Caterpillar determined that it was not a defect
 15 in material or workmanship.
 16 Q. How did they determine that?
 17 A. Based on the information that was provided from
 18 the field from the dealer and looking at the
 19 information on all C-12s in the field.
 20 Q. Who provided the information? You referred to
 21 the dealer in the field. Who --
 22 A. I'm not sure who specifically provided it. I
 23 don't know if it was Al Cardoza specifically.

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1 That's the name I've heard has been involved
 2 but I don't know if he was the only one who
 3 provided information.
 4 Q. Did anyone ever contact you or anyone else at
 5 Caterpillar to inquire about the denial of
 6 reimbursement?
 7 A. I was never contacted regarding the denial of
 8 claims for Trans-Spec for flywheel housing --
 9 Q. Was any --
 10 A. -- repairs.
 11 Q. -- one else at Caterpillar contacted?
 12 A. Was anyone else at CAT contacted for --
 13 Q. About Trans-Spec's problem either by Trans-Spec
 14 or someone calling on Trans-Spec's behalf or
 15 communicating on Trans-Spec's behalf via e-mail
 16 or fax or letter, phone call?
 17 A. I do not know. I stated what my understanding
 18 is of Rob Smith's involvement, Mike Powers and
 19 to a limited degree Al Cardoza. I'm not aware
 20 of any other communication.
 21 Q. Do you know how the decision was communicated
 22 to Trans-Spec?
 23 A. I am not aware of how that was done.

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1 Q. Did you try to find out pursuant to the Rule
 2 30(b)(6) deposition preparation?
 3 A. I understood the decision was made, the
 4 district rep was informed. And beyond that, it
 5 was between them and the CAT dealer to
 6 communicate that information back to the
 7 customer.
 8 Q. Who was the district rep at the time?
 9 A. I believe that was Mike -- Rob Smith.
 10 Q. Did you call Rob Smith to check to prepare for
 11 this deposition?
 12 A. I did have conversation with Rob, but I do
 13 not -- I do not believe we spoke specifically
 14 as to how the customer was informed of the
 15 decision.
 16 Q. Do you know if Trans-Spec tried to contact
 17 Caterpillar in any way to ask about this
 18 decision?
 19 A. I was not contacted by Trans-Spec. I do not
 20 know if they tried to contact anyone in
 21 Caterpillar.
 22 Q. Do you know if Al Cardoza called in
 23 Trans-Spec's behalf?

Clarissa Colmer

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1 MR. GRUNERT: Object to the form.
 2 A. I am not aware of other customers that were
 3 running Sterling trucks and whether or not they
 4 had flywheel housing repairs.
 5 Q. Is Trans-Spec the only customer that
 6 Caterpillar refused to reimburse for flywheel
 7 housing and flywheel house failures?
 8 MR. GRUNERT: Object to the form.
 9 A. I am not aware of any specifics beyond
 10 Trans-Spec.
 11 Q. Did Caterpillar resume reimbursing for
 12 Trans-Spec's flywheels and flywheel housings in
 13 August 2004?
 14 MR. GRUNERT: You can look at your
 15 documents if you want.
 16 A. Under what program are you referring to?
 17 Q. In any program.
 18 A. I believe some claims were paid under good will
 19 after 2004.
 20 Q. Were any paid pursuant to extended service
 21 coverage?
 22 A. I believe there was one claim paid to extended
 23 service coverage.

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1 Q. What was that one claim?
 2 MR. GRUNERT: Claim number Q931105.
 3 Q. What was that claim for?
 4 A. Correct flywheel housing.
 5 Q. And when was it dated?
 6 A. Which day are you referring to?
 7 Q. When was the repair performed?
 8 A. Repair was performed August 17th, 2004.
 9 Q. How do you know it was reimbursed under
 10 extended service coverage?
 11 A. I can see on the claim what coverage programs
 12 the expense was assigned to.
 13 Q. Was the flywheel housing repair specifically
 14 assigned to extended service coverage or were
 15 other repairs -- In other words, I know that
 16 sometimes claims are split where some of the
 17 money comes pursuant to extended service
 18 coverage and some are pursuant to good will.
 19 A. This particular claim the parts were expensed
 20 to standard warranty and the labor was expensed
 21 to extended service coverage.
 22 Q. And the parts that were expensed to warranty
 23 were flywheel housing?

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1 A. It was \$2,389.73.
 2 Q. And that included the cost of a new flywheel
 3 house?
 4 A. Yes.
 5 Q. What else did it include?
 6 A. Pipe plug, washer, cap, bolt, dowel and the
 7 flywheel housing.
 8 Q. And then you said a number of repairs were
 9 reimbursed under good will. Why was this one
 10 specifically reimbursed under ESC?
 11 A. The claim was filed as a flywheel housing
 12 failure and the analyst understood that the
 13 flywheel was a covered component and paid for
 14 it as such.
 15 Q. What about the decision in 2003 to stop
 16 reimbursing on Trans-Spec's flywheel housing
 17 failures?
 18 A. I found no evidence that our group was informed
 19 of that decision.
 20 Q. The warranty claim division never even knew
 21 that Caterpillar had stopped reimbursing
 22 Trans-Spec for the flywheel housing failures?
 23 A. No, we were not made aware of that decision.

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1 Q. So was this a mistake to cover this under the
 2 extended service coverage?
 3 A. This repair should not have been covered.
 4 Q. Under extended service coverage?
 5 A. Under either warranty or extended service
 6 coverage due to -- due to the decision that
 7 was made in 2003 that had determined that this
 8 failure was not a defect in CAT material or
 9 workmanship.
 10 Q. Was this claim eventually covered under good
 11 will? In other words, was it deemed to be
 12 erroneous pursuant to extended service coverage
 13 or standard warranty and ended up getting
 14 covered by good will?
 15 A. I do not know if this claim was subsequently
 16 debited and reissued.
 17 Q. How about the other claims that were reimbursed
 18 pursuant to good will, why were they -- why
 19 were they covered by good will?
 20 A. Which claims?
 21 MR. GRUNERT: Object to the form.
 22 BY MR. SAMITO:
 23 Q. Well, you tell me. You referred to a number of

18 (Pages 66 to 69)

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EXAMINATION BY MR. GRUNERT:

Q. Ms. Colmer, Mr. Samito asked you the reason why the people who made the decision that Trans-Spec flywheel and flywheel housing failures should no longer be paid under warranty, what they took into account in making that decision, and you testified I think to the effect that they took into account not only information they had gotten from the dealer about application, but also the general performance of C-12 engines or words to that effect.

Can you explain what you mean by that part of the answer?

A. I understood that when they looked at the failure history on Trans-Spec's units they looked at the history of flywheels in general on all C-12s and that there was not a significant failure rate in relationship to the failure rate that Trans-Spec was seeing that was occurring on Trans-Spec units, that the failure on Trans-Spec's units was significantly

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greater than the general population of C-12s.

MR. GRUNERT: That's all I have.

MR. SAMITO: I have a few more. Possibly one, we'll see.

FURTHER EXAMINATION BY MR. SAMITO:

Q. Did Caterpillar routinely stop reimbursing under warranty if it saw a repair that was out of the ordinary?

MR. GRUNERT: Object to the form.

A. Caterpillar's decisions to discontinue paying claims are based upon the fact on whether or not they deem it as a defect in material or workmanship.

Q. Well, one more I guess. How did the fact that flywheel housings usually don't break or fail, how did that play into this decision to stop reimbursing for Trans-Spec?

A. One of the areas that was heavily considered was the significant failure rate of the -- was the significant failures of the flywheel housings on these units, repetitive failures that did not show up in the general population.

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Q. Did the people who make the decision consider that other companies owning C-12 engines had also had flywheel housing failures and flywheel housing bolt failures on them?

A. I believe that they looked at the claim history on the C-12 population when making that decision.

Q. And is it determinative if a customer of Caterpillar submits a claim for a relatively rare failure, is that determinative on whether or not Caterpillar's going to reimburse?

A. The decision to reimburse is based upon whether or not the failure is the result of a defect in CAT material or workmanship.

Q. So the fact of the rate of incidence of the failure really doesn't matter, does it?

MR. GRUNERT: Object to the form; contrary to what she testified to.

MR. SAMITO: I'm trying to ask how it matters but I'm not getting an answer to that question.

MR. GRUNERT: Can you answer that question? I object to the form of it.

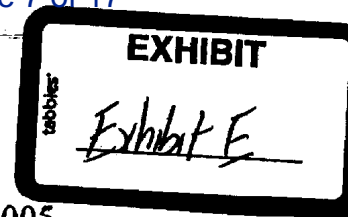
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A. I understand it was due to the repetitive nature of the failures and the additional information that they had acquired on these units that allowed -- that led them to make that decision.

MR. SAMITO: I have nothing more.

MR. GRUNERT: Thank you, that's all I have.

FURTHER DEPONENT SAYETH NOT



December 7, 2005

Ms. Nancy Reimer
Donovan Hatem LLP
Two Scaport Lane
Boston MA 02210

Re: Analysis of Flywheel Housing Failures

Dear Ms. Reimer:

This letter serves as my report into the failure of the flywheel housings experienced by Trans-Spec Truck Service, Inc.

I. Background

During the period from late 1999 to early 2000, Tran-Spec took delivery of 22 Sterling trucks that were powered with Caterpillar C-12 engines. Trans-Spec had previously owned trucks that had been powered with Caterpillar 3176 engines. These vehicles were used primarily for the delivery of heating oil in the New England area.

The C-12 engines were delivered by Caterpillar with an aluminum flywheel housing that was intended to support the engine and the transmission. Although the trucks were built by Sterling, it is my understanding that Caterpillar approved the overall design of the truck and warrantied the C-12 engine system for 60 months/500,000 miles.

The flywheel housing is connected to the engine with twelve M12, 10.9 grade, bolts and to the transmission with 12 substantially smaller diameter bolts. The housing is aligned with the block by means of two dowels. The flywheel housing was also connected to the vehicle frame by means of two engine mounts.

Soon after delivery the flywheel housings started failing. These failures were characterized by the loosening of the bolts that connected the engine to the flywheel housing. The failures were also characterized by cracks developing in certain locations

of the flywheel housing, severed bolts and dowels, deformed and damaged bolt holes, and wear patterns at the bottom of the housing. When a flywheel housing failed on the C-12 engine, the truck would necessarily have to be taken off the road for a costly and extended repair.

The engines as designed, manufactured, and sold by Caterpillar were defective by reason of this design flaw and normal usage would render the engines and trucks unusable. These engines were covered by the Caterpillar extended warranty which obligated Caterpillar to repair the engine components, where feasible, or to replace the engines or defective components. Caterpillar refused to honor the warranty.

2. Inspection of the flywheel housings

I have inspected several flywheel housings that showed various degrees of failure:

(a) Flywheel Housings at Altran. It is my understanding that two housings were removed from Trans-Spec vehicles because they had failed and were transferred to Altran in Boston for evaluation. One of these came from a C-12 engine and the other from a 3176 engine. Both showed significant cracks and damage to the bolt holes that connect the flywheel housing to the engine. Both housings also showed significant wear to the lower regions that face the oil pan and oil pan gasket. It is my understanding that Dr. Thomas Service will be submitting a detailed report on these two housings.

(b) Flywheel Housings at Trans-Spec. I inspected two flywheel housings that were still installed on two disabled trucks that had been in rollover accidents. There were no visible signs of cracking or other signs of failure to either housing. One of the housings was removed at my request. I inspected this housing after it was cleaned. It still showed no discernable damage despite the fact that it had been in a serious accident.

(c) Flywheel Housings at Caterpillar. On November 29, 2005, when I visited the Caterpillar facility at 1201 N. University in Peoria, Illinois, I was able to visually inspect 7 flywheel housings. It was my understanding that these housings had been removed from Trans-Spec trucks when they had failed. Figures 1-7 (see Appendix) show a representative collection of pictures that were taken under my direction by an independent photographer during my visit.

Fig. 1A shows the first housing that I inspected on November 29 at Caterpillar. Figs. B, D, and E show two large cracks that are in the lower left hand (when observing the housing from the engine side) corner of the housing.

Figure 1C shows a deformation of one of the bolt holes. This type of deformation was seen to various degrees in many of the holes of the failed housings that I inspected, both in Boston and Peoria. This failure is characterized by threadlike ridges that were cut into the much softer aluminum by the M12 bolt threads. These holes were designed to be through holes and are not intentionally threaded.

Fig. 2A shows the second housing that was inspected. This housing shows a limited amount of wear in the lower part of the housing that faces the oil pan. This should not be occurring in this location since this is not a mating surface. Fig. 2B shows one of the bolt holes that has sustained limited damage from the bolt. It should be noted that there should be a clearance of $\frac{1}{2}$ mm between each of the 12 bolts and the respective bolt hole wall. So in a properly functioning housing, the bolt threads should not touch the inner surface of the bolt hole.

Figs. 2C and 2D show a large crack in the vicinity of the housing as in the housing in Fig. 1. As in the previous housing, this crack intersects one of the bolt holes.

Fig. 3A shows the third housing that was inspected in Peoria. As can be observed, the housing has extensive road dirt, oil, and grime which obscure large sections of the housing. It was not possible to remove all this during the inspection. I was able to clean a small portion near the lower left hand bolt hole and observed a similar crack to those in Figs. 1 and 2. This crack is shown in Figs. 3B and C. Fig. 3D shows damage to the region where the housing is attached to the truck body with an engine mount. Fig. 3E again shows damage to a bolt hole.

Fig. 4 shows the extensive damage of the flywheel housing. Fig. 4B shows a sheared bolt and badly deformed dowel hole in the lower left hand corner of the housing. Fig. 4C shows more sheared bolts and damage to the inner lip of the housing. The aluminum appears to have softened and flowed in this region. Fig. 4D shows a badly damaged bolt hole. In addition to the threads being cut into the sides, the lip has been fractured. Fig. 4F shows the heads of two of the M12 bolts that were sheared. The bolt heads are discolored and show significant abrasion. Fig. 4E again shows damage to the region where the housing is attached to the truck body with an engine mount. Fig. 4G shows the flywheel side of the housing. No cracks could be observed either on the inside or outside surface of the housing. Also, despite the extensive damage to the bolts and dowels between the transmission and the engine, little or no damage could be observed to the surface and bolt holes that attach the flywheel housing to the clutch housing and the transmission.

The flywheel housing in Fig. 5 also had no visible cracks, but did show damage to bolt holes and the engine mount area. The housing in Fig. 6 shows very similar damage

to the housing shown in Fig. 5, except that this housing has a significant crack in the lower left hand area.

There were no visible cracks in the housing shown in Fig. 7, although limited bolt hole damage was observed. However, this housing was unpainted and showed no signs of having ever been painted. It is my understanding that Trans-Spec never used an unpainted housing so it is unlikely that this housing was from Trans-Spec.

3. Conclusions

My inspection of these housings, showed that the bolted interface between the Caterpillar C-12 engine and the Caterpillar housing had failed. Repair/warranty records of the Trans-Spec trucks show the flywheel housing failed repeatedly on all of the vehicles. The frequency of these failures is unacceptable.

Information made available by Caterpillar as a part of the litigation showed that housing failures occurred on the Caterpillar C-12 engines with other OEM's and customers. They also occurred on the Caterpillar C10 engines that have a similar aluminum flywheel housing. As mentioned earlier in this report, I personally observed housing from a 3176 engine.

The frequency of the housing failures in the Trans-Spec C-12 engines, and the fact that similar housings failed in other engine models and for other customers, indicates that there was a problem with the housing used on the C-12 engines.

Documents disclosed in this case indicate that the Trans-Spec C-12 engines were used within their specifications in the Sterling truck. In fact, internal Caterpillar emails indicate the possibility was considered by Caterpillar that the Trans-Spec engines were failing because they were being used improperly or outside their specs. These documents

also indicate that Caterpillar concluded, based on its own analysis, that the engines were being used within specifications.

One possible source of the problem that is specifically considered by Caterpillar is the weight of the Meritor transmission model RMX10-165C that bolts to the opposite side of the housing from the engine. Caterpillar specifically indicates in its own documents that it considered this issue and came to the conclusion that the weight of the Meritor transmission and attached PTO's were not the cause of the flywheel housing failures.

My own conclusion, based on my own analysis, indicates that the use of the Meritor transmission was not only pre-approved by Caterpillar when the vehicles were ordered, but that they were within spec. Furthermore, it is noteworthy that the interface between the flywheel housing and the transmission did not fail in any of the cases that I investigated where the housing/engine interface failed. This is a strong indicator that the problem is not the transmission.

The documents also show that an additional support was added to the transmission by Trans-Spec as recommended by Caterpillar for heavier transmissions, although such support was not indicated by the specs for the Meritor transmissions. However, my discussion with Trans-Spec personnel and Caterpillar internal documentation indicated that this additional support did not solve the cause problem.

In July 2004, Caterpillar tested one of the Trans-Spec trucks on a dynamometer to determine if vibrations due to the powertrain were within limits. The vehicle was driven at various speeds.

Mr. Bowes, in his deposition (pp. 233-234) says that the test results indicate that the engine in the Trans-Spec vehicle is a "perfectly normal operating engine." However, the vibration sensors in this test would have picked up much more than just the vibration from the engine. They would have picked up vibration from the other components of the drivetrain, including the transmission. So the positive results of this test are a demonstration that the drivetrain as a whole was functioning properly.

I understand from a conversation with Trans-Spec service technician, Mr. Abel LaFlash, that the first indication of a problem was frequently that certain bolts, typically the lower bolts, that attached the Caterpillar housing to the Caterpillar engine would start loosening.

Based on my review of documents in this case, my own analysis and my conversations with Trans-Spec personnel, I have come to the conclusion that failure of flywheel housings were caused by a design flaw and not because of any deficiencies in the way the C-12 engines were installed or used by Trans-Spec or others.

It is clear from the documents that certain individuals at Caterpillar agreed with this conclusion. In fact, it is my understanding that Caterpillar, at least initially, agreed with this conclusion because it replaced failed housings under warranty.

4. Cause of the problem

Based on the information available, to a reasonable degree of scientific certainty, the failures of the housings were caused by a design flaw. The flywheel housings in question are made of aluminum.

To my knowledge, Caterpillar design documents for this housing were not made available, so it is not possible to determine whether Caterpillar considered thermal loads

and stresses in their design process. Specifically, there are no documents that I have observed that show this issue was considered during the design process.

What is clear, however, is that Caterpillar knew the aluminum flywheel housings were problematic. For example, in its U.S. patent number 6,065,757, a Caterpillar patent filed July 12, 1998, entitled Flywheel Housing, the inventors disclosed to the U.S. patent office that:

"Engineers are designing flywheel housings that are lighter weight and less costly. Over the years engineers have discovered that weight and cost reductions are achieved by manufacturing flywheel housings out of aluminum. During normal operation of an engine, cyclic temperature changes can cause thermal expansion and contraction of various components at varying rates. The use of components made of different materials adds to the relative movement between thermal expansion greater than the thermal expansion of a cylinder block causing relative movement between the flywheel housing and the cylinder block. The relative movement between the flywheel housing and the cylinder block, if not absorbed by a seal positioned between the two components, can cause the flywheel housing or seal to leak, crack or can destroy connecting bolts used for connecting the flywheel housing to the cylinder block." (Col. 1, lines 10-36)

The inventors further explained that their improved housing would tolerate "... thermal stresses, operating vibration, and harsh environment that are normally present during engine operation ." (col. 3, lines 29-32.)

During the prosecution of their application, in an amendment dated 11-22-99, the inventors argued that their improvement was novel because the prior art aluminum flywheel housings suffered from "greater thermal stresses, operating vibration, and harsh environment." (Page 8 of Amendment)

This patent application was filed prior to the delivery of the engines to Trans-Spec. The flywheel housing in the C-12 engines was made of aluminum. The improvement disclosed in the Caterpillar patent was not incorporated. At least some of

the problems disclosed in the patent as being symptomatic of aluminum housings were observed in the Trans-Spec engines.

I also understand that Caterpillar also supplied engines to the Department of Defense through Stewart & Stevenson. At least some of these engines that had aluminum flywheel housing failed due to cracking. I understand Caterpillar remedied this problem by replacing the aluminum flywheel housing with a cast iron housing.

In his deposition, Mr. Bowes indicates that when a new housing is designed, Caterpillar typically uses a finite element model of the housing and then applies loads according to "these" accelerations. (page 63, lines 18-22).

In my opinion, this is lacking and deficient for a number of reasons. First, thermal stresses are ignored. As was clearly indicated by the inventors of US patent 6,065,757, thermal stress is key and can cause "bolts to break." The significantly higher expansion coefficient of aluminum compared to steel will cause increased stresses in both the axial and radial directions. Temperatures in the areas of the flywheel housing will rise as the engine reaches operating temperature because of the proximity of the hot oil pan and the exhaust system. Also, several of the flywheel housings have shown a significant amount of wear in the region that faces the oil pan. This wear would significantly increase the temperature of the housing compared to the engine block, exacerbating the thermal stresses. Secondly, the approach ignores stresses due to engine torque which can also significantly increase the loads on the bolted interface.

Regardless of whether Caterpillar considered thermal loads during the design of C-12 engine and its flywheel housing, I have seen no indication that Caterpillar considered this issue after failures were observed.

Caterpillar made no effort to consider this issue in the only finite element analysis of the C-12 flywheel housing that I have observed. I have seen no data of tests run on vehicles in actual use that even attempted to measure temperature or strains and stresses in the flywheel housings.

I consider the failure analysis of this problem that I have observed by Caterpillar to be inadequate.

5. Summary of Conclusions

1. Aluminum flywheel housing supplied by and warrantied by Caterpillar to Trans-Spec failed.
2. Caterpillar had observed such failure in other engines and with other customers when aluminum housing was used.
3. Caterpillar knew that aluminum housing had a flaw that could cause failure such as those observed at Trans-Spec.
4. Caterpillar knew that changing the material of the housing to cast iron solved the problem in at least one case.
5. The design of the flywheel housing rendered the engine defective.
6. I have seen no basis that was offered by Caterpillar for rejecting Trans-Spec's warranty claims.
7. Caterpillar was obligated under the warranty to repair or replace defective engines and/or components. Alternatives that Caterpillar was aware of included the use of cast iron flywheel housings, the flywheel housing disclosed in the Caterpillar patent or the use of a metal plate under the bolt

heads as disclosed in Exhibit 12 of the Bowes Deposition. Caterpillar did not fulfill its obligations.

8. Rather than fulfill warranty obligations, Caterpillar instead performed inadequate tests that did not demonstrate the cause of the failure of its flywheel housings nor justified the denial of warranty claims.

6. Documents referred to or used:

Patent 6,065,757 and File Wrapper (attached)

Stewart and Stevenson information (attached)

Bowes and Colmer Depositions and Exhibits

Caterpillar-produced documents Bates numbered 1-4014

Caterpillar's Answers to Interrogatories and all attached exhibits

All documents produced by Trans-Spec to Caterpillar except for those maintained in a storage trailer at Trans-Spec's facility

Photographs taken of flywheel housings located at Caterpillar

Final Invoice/spec sheet produced by Minuteman Trucks, Inc. (attached)

7. List of Publications

See attached c.v.

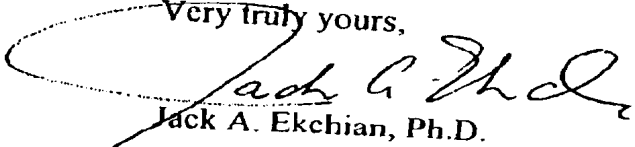
8. List of Cases in which I have testified as an expert at trial of by deposition

See attached c.v.

9. Compensation

\$ 300/hour.

Very truly yours,


Jack A. Ekchian, Ph.D.